ADSC/WSDOT Team Members

September 13th, 2007

Members In Attendance

Name	Company	Telephone	E-mail
Allen, Tony	WSDOT	360-709-5450	allent@wsdot.wa.gov
Bauer, Mike	WSDOT	360-705-7190	bauerm@wsdot.wa.gov
Carnevale, Bob	DBM	253-838-1402	rcarnevale@dbmcm.com
Clarke, Patrick	WSDOT	360-705-7220	clarkp@wsdot.wa.gov
Cuthbertson, Jim	WSDOT	360-709-5452	cuthbej@wsdot.wa.gov
Frye, Mark	WSDOT	360-709-5469	fryem@wsdot.wa.gov
Gaines, Mark	WSDOT	360-705-7827	gainesm@wsdot.wa.gov
Goodhue, Gif	KB	281-948-1257	gif@kbtech.com
Macnab, Alan	CJA	206-575-8248	amacnab@condon-johnson.com
Nicholas, Cathy	FHWA	360-753-9412	Cathy.nicholas@fhwa.dot.gov
Rasband, Al	Malcolm Drilling	253-395-3300	arasband@malcolmdrilling.com
Sexton, Jim	DBM	253-838-1402	jims@dbmcm.com
Sheikhizadeh, Mo	WSDOT	360-705-7828	sheikhm@wsdot.wa.gov
Starcevich, John	Malcolm Drilling	253-395-3300	jstarcevich@malcolmdrilling.com

The meeting began at 8:30 AM. Attending on behalf of the Washington State Ferries branch of WSDOT were:
Chuck Ruth
Lisa Parriot &

Jeff Kilborn from Berger/ABAM.

1. Constructability Review

Washington State Ferries Eagle Harbor

Washington State Ferries has an upcoming project to retrofit and upgrade a maintenance building located at Eagle Harbor on Bainbridge Island. This structure is supported by 12" diameter timber piles and is surrounded by a piling-supported pier. This project upgrades the inadequate seismic capacity of the existing building.

Jeff from Berger/ABAM provided the Group with a summary of the project. The largest item of work is the construction of sixteen 3'-0" diameter drilled shafts that are about 50 feet long. These drilled shafts need to be installed from inside the maintenance building. The vertical clearance inside the building is 37'-0" to the bottom of the ceiling trusses and 44'-0" to the roof. The contract will prohibit vibratory methods of casing installation. WSF asked for input on constructability concerns.

Concerns were raised about the permanent casing. This item is state supplied, and the capacity of the casing is being counted on structurally. As a result, full penetration welds are required at casing splices. ADSC recommended against using State-supplied material, and they advised against full penetration welds. Making up the welded splices would be time consuming and expensive. The team also advised to allow the rebar cage to solely resist the bending demand and not rely on the casing. One ADSC Member suggested trying to raise the shaft tip several feet. With the clearances inside the building, constructing a 50 foot shaft will require splicing the rebar cage during installation. If the tip can be raised up, a single-piece cage may be possible. Maintenance of 10' slurry is also a concern and lower head should be mentioned in the Specials.

Jim Sexton expressed concern about clearances for operating a drill rig inside the building. Another ADSC Member suggested that WSF should consider allowing vibratory methods to install the permanent casing. The State could place limits on vibration levels in the contract. Alan Macnab recommended further investigation of the site soils. He suggested using sidescan radar out of a bore hole.

Action Plan:

- Alan to provide formal written comments to Mo within 10 days.

US2 Lowering Soil Nail Wall

WSDOT Geotech provided a handout and discussed an upcoming wall project on US2. The existing site consists of tiered structural earth walls that retaining soils for the roadway around an existing 8' by 8' culvert. This project installs a new backfilled wall to allow US2 to be widened. WSDOT Geotech has identified two options for the wall:

> **Option A** – This is the current option being designed. It consists of a new concrete fascia wall that is backfilled with geofoam. Because of the steep slope, the bottom of the wall will require a footing that will be anchored into the slope by a single row of soil nails.
> **Option B** – The existing upper MSE wall would be removed and replaced with a conventional MSE wall. Because of the significant new load this will place on the existing lower wall, it will be reinforced with three rows of soil nails.

WSDOT Geotech asked for input of the feasibility of Option B. The general consensus amongst the ADSC Members was that Option A seemed the most feasible. The single row of soil nails required for this Option could be drilled from the road above. This option avoids conflicts between the soil nails and the MSE wall reinforcement that would occur with Option B.

Action Plan:

- Alan to provide formal written comments to Mo within 10 days.

2. Review/Approval of June 6, 07 Meeting Notes

The June 6 meeting notes were reviewed and approved with no comments.

Action Plan:

- No action needed.

3. Action Item Reports

i. Use of Salt Water in Slurries

As a summary of the past discussions on this issue WSDOT has concerns about using salt water slurry in drilled shafts. WSDOT's main concern is the potential initiation of corrosion on the reinforcing bar when it is submerged in the salt water slurry.

Gif Goodhue discussed his perspective on the use of salt water slurry in drilled shafts. He said that this construction method has been used successfully on numerous international projects. He pointed out a number of challenges with attempting to use fresh water slurry in a saltwater environment, including:

- Issues maintaining proper head since salt water is denser than fresh water. This is of particular concern for deep shafts.
- Difficulty replacing the salt water with fresh water.
- Even if all the salt water is replaced with fresh water, osmosis will occur. The salinity of the water inside the shaft will attempt to reach equilibrium with the water outside the shaft.
- If the slurry inside the shaft is set up for fresh water and osmosis occurs, the slurry will degrade over time. This may affect the ability of the slurry to support the shaft.

Considering these challenges, Gif strongly encouraged the State to consider allowing salt water slurries in marine environments. He offered to do some research on the reinforcing coating system that is used overseas when constructing shafts with salt water slurry. Gif believes the coating to be something different then the green epoxy coating used in this area. Gif also offered to send a paper out that summarizes load cell results for drilled shafts.

Action Plan:

- Gif to research bar coating systems and report back at next meeting
- Gif to send out paper summarizing load cell results of drilled shafts.
- Mo will continue to evaluate WSDOT's position and will provide an update at the next meeting.

ii. Overnight Protection of Shafts

Mike Bauer handed out an updated Drilled Shaft Special Provision that included a number of changes related to the overnight protection of shafts. In general, the Task Force Members were satisfied with the new language. These revisions allow limited periods of time where a drilled shaft can be left open without backfilling. Gif expressed concern that the revised Specification doesn't address slurry loss. During a 16-hour stoppage, it is crucial that slurry loss be controlled.

Alan Macnab agreed to work with Gif to develop language for the Specification that addresses the slurry loss issue.

Because of the extent of these changes, Mike asked everyone to review this language and bring comments to the next meeting.

Action Plan:

- Gif Goodhue and Alan Macnab to develop specification language that addresses the slurry loss issue. They will update the Team at the next meeting.
- All Task Force Members review the revised language and bring comments to the next meeting.

iii. Soldier Pile Lagging Specification Draft

Mike Bauer handed out proposed revisions to Standard Specification Section 6-16 that allows Contractor-designed lagging for soldier pile walls. The following comments from Alan Macnab were discussed:

- This Specification should better address what types of materials can be used to backfill any voids that may occur behind the lagging. In the absence of any requirements, it is sometimes difficult to get approval from the Inspectors. Alan will discuss with ADSC and come up with recommendations.
- The proposed Specification uses a table that is partially derived from soil classification used by the Washington Administrative Code (WAC). Alan encouraged the State to use Jaworski's Chart (from FHWA) instead. WSDOT Geotech will review.
- Alan had suggestions on ways to improve Section 6-16.3(6)C. He will review and propose revised language for this section at the next meeting.

Action Plan:

- Alan Macnab to address the first and third items above and report to the Team at the next meeting.
- Jim Cuthbertson to work on the second item above and report to the Team at the next meeting.

iv. Proposed Changes to Section 3.03

This item was deferred until the next meeting. Al Rasband wants to review this, but he thinks we are close.

Action Plan:

- Al Rasband to review changes to Section 3.03.
- Mo to include on agenda for the next meeting.

vi. Shaft/Column Splice Zone Vibration

Mike Bauer made changes to require vibration of the shaft/column transition zone (Section 3.07B). This was reviewed by the Task Force with no comments.

Action Plan:

- No action needed.

vii. Shaft Contractors' Prequalification Class

Mo passed out proposed language for the Shaft Contractors' Prequalification Class. This requires Contractors to have constructed at least three foundation projects with drilled shafts of similar size, depth and ground conditions as those shown in the plans. This language also places minimum requirements on the on-site supervisor and drill rig operator.

Alan had some concerns about this language. He didn't feel that a Contractor who had constructed a few 8'-0" diameter cell tower shafts would be qualified to do a job with 150 drilled shafts. However, under this proposed language, they may qualify. Alan will discuss this with ADSC and make some suggestions.

Action Plan:

- Alan to discuss with ADSC and make some suggestions.

4. Review of the Vibration Specification

Mo presented Standard Specification Section 6-02.3(6)D to the Task Force for review and comment. This is the Standard Specification requirement to protect fresh concrete from damage due to vibration. If the task force agrees, this section could replaced the portion of the Drilled Shaft Special Provisions that relates to protecting shaft concrete from vibration.

One Task Force Member pointed out that although early break cylinders could be taken, they would be cured at different conditions than the rest of the shaft concrete. Internal drilled shaft temperatures get fairly high due to heat of hydration. The early break cylinders wouldn't be representative of actual concrete strength.

Mo mentioned that this section would need some updating to reflect drilled shaft construction equipment.

Alan asked if this section pertained to the CDF/lean mix concrete used in soldier piles. Mo said that this section doesn't apply to CDF or lean mix.

ADSC will review this proposal and provide comments at the next meeting.

Action Plan:

- Alan to coordinate review with ADSC members and provide feedback at next meeting.

5. WSDOT Submittal Review Process

Al Rasband expressed frustration over the submittal review process performed by WSDOT. On a recent project, a plan error was identified during shop drawing review.

This error required changes to the pile lengths for a soldier pile wall. The Contractor had proceeded with procuring the soldier pile material prior to this error being identified. WSDOT refused to participate in the added costs because our contract prohibited fabrication of materials prior to receiving shop drawing approval.

Al pointed out the difficult in procuring steel. Contractors have no choice but to order materials prior to shop drawing approval. Al didn't see how placing a material order constituted "fabrication". Mo agreed to review and to consider a change that would allow materials to be ordered prior to receiving shop drawing approval.

Action Plan:

- Mo to investigate and report back at next meeting.

6. PGA Access Hole Pipe Reinforcing

Since Mark Etheridge wasn't present, this item was deferred to the next meeting.

Action Plan:

- Mo to put on agenda for the next meeting.

7. CSL Installation Outside the Cage

Mark Gaines asked for input on the feasibility of installing CSL tubes outside the reinforcing cage. This would allow better verification of competent concrete around the reinforcing cage. Currently, CSL tubes are usually positioned inside the wagon wheel reinforcing.

Most ADSC Members had concerns about this. It would be challenging to tie the tubes in place on the perimeter of the cage. This would be especially difficult on large diameter shaft cages. Alan Macnab mentioned that New York requires CSL tubes to be installed outside the reinforcing cage.

Action Plan:

- No action needed.

8. Installation/Extraction of Work Platform Supports

On a number of recent WSDOT drilled shaft projects, shaft construction has been performed from a work trestle. The trestles are usually supported by a large number of driven piles, and the piles are normally removed for salvage after construction is complete. Mo asked for feedback on how the pile removal affects the capacity of the shaft.

There was some discussion whether or not this would be a significant factor. ADSC stated that this work is almost always done by the Prime Contractor rather than the Drilled Shaft Subcontractor. The Prime would also be making the decision whether or not to remove the piles after construction. ADSC suggested that a better forum for this item would be the WSDOT/AGC task force.

Action Plan:

- No action needed.

Additional Items

Alan Macnab mentioned that Foundation Drilling magazine would now be free to all Task Force Members. If anyone wants to receive this publication, please provide a business card to Alan and he will get you signed up.

Action Plan:

- No action needed.

Future Meeting Dates

Because of a conflict, the next meeting scheduled for October 25th was cancelled. The Task Force agreed on the following dates for future meetings:

- November 15th
- December 13th

The meeting that was previously scheduled for November 29th was also cancelled.